CLAIMS

What is claimed is:

1. A circuit for driving an array of light emitting devices (LEDs) comprising:

a first set of series connected LEDs to generate a first light having a first wavelength during a first emission time frame;

a second set of series connected LEDs to generate a second light having a second wavelength during a second emission time frame, the second wavelength being different from the first wavelength;

a power supply providing a shared current source to the first and second set of LEDs;

a first switch arranged in series with the first set of LEDs;

a second switch arranged in series with the second set of LEDs; and

a display controller coupled to the power supply and the first and second switches, the display controller adapted to generate a first and second control signal respectively in accordance with a first and second color frame sequential data, the first control signal operating on at least the power supply or the first switch to drive the first set of LEDs during the first emission time frame, and the second control signal operating on at least the power supply or the second switch to drive the second set of LEDs during the second emission time frame, wherein the first and second emission time frames are contiguous with one another.

2. The circuit of claim 1, further comprising:

a third set of third LEDs to generate a third light having a third wavelength during a third emission time frame, the third wavelength being different from the first and second wavelengths;

a third switch coupled to the third set of LEDs;

wherein the power supply provides the shared current source to the third set of third LEDs; and

wherein the display controller is further adapted to generate a third control signal in accordance with a third color frame sequential data, the third control signal operating on at least the power supply or the third switch to drive the third set of LEDs during the third emission time frame, wherein the third emission time frame is contiguous with the first and second time frames.

3. The circuit of claim 2 wherein the first, second, and third sets of LEDs emit red, green, and blue light, respectively.

4. The circuit of claim 2 wherein the first, second, and third sets of LEDs emit yellow, cyan, and magenta light, respectively.

5. The circuit of claim 2 wherein the first, second, and third sets of LEDs are light emitting diodes.

6. The circuit of claim 2 wherein the first, second, and third sets of LEDs are laser diodes.

7. The circuit of claim 2, wherein the display controller generates a compensating control signal to operate on at least one of the first, second, and third switches to compensate for a failed LED in the first, second, and third sets of LEDs, respectively.

8. The circuit of claim 2, wherein the first, second, and third control signals further operate on a current level of the current source to adjust the brightness of the light emitted by the first, second, and third sets of LEDs, respectively.

9. The circuit of claim 2, wherein at least one of the first, second, and third sets of series connected LEDs is further comprised of at least one set of series-parallel arrays of LEDs, respectively.

10. A circuit for driving an array of light emitting devices (LEDs) comprising:

a first set of series connected LEDs to generate a first light having a first wavelength;

a second set of series connected LEDs to generate a second light having a second wavelength, the second wavelength being different from the first wavelength;

a power supply providing a first and second current source to the first and second set of LEDs, respectively;

a display controller coupled to the power supply, the display controller adapted to generate a first and second control signal respectively in accordance with a color frame data, the first control signal operating on the first current source to drive the first set of LEDs continuously, and the second control signal operating on the second current source to drive the second set of LEDs continuously.

11. The circuit of claim 10, further comprising:

a third set of series connected third LEDs to generate a third light having a third wavelength, the third wavelength being different from the first and second wavelengths;

wherein the power supply provides a third current source to the third set of LEDs; and

wherein the display controller is further adapted to generate a third control signal in accordance with the color frame data, the third control signal operating on the third current source to drive the first set of LEDs continuously.

12. The circuit of claim 11 wherein the first, second, and third control signals operate on a first, second, and third current level of the first, second, and third current sources to adjust the brightness of the first, second, and third lights, respectively.

13. The circuit of claim 11 wherein the first, second, and third sets of LEDs emit red, green, and blue light, respectively.

14. The circuit of claim 11 wherein the first, second, and third sets of LEDs emit yellow, cyan, and magenta light, respectively.

15. The circuit of claim 11 wherein the first, second, and third sets of LEDs are light emitting diodes.

16. The circuit of claim 11 wherein the first, second, and third sets of LEDs are laser diodes.

17. The circuit of claim 11, wherein the current levels of the first, second, and third current sources correspond to the brightness of the light emitted by the first, second, and third sets of LEDs, respectively.

18. The circuit of claim 11, wherein at least one of the first, second, and third sets of series connected LEDs is further comprised of at least one set of series-parallel arrays of LEDs, respectively.

19. A circuit for driving an array of light emitting devices (LEDs) comprising:

a means for generating a first light having a first wavelength during a first emission time frame from a first set of series connected LEDs;

a means for generating a second light having a second wavelength during a second emission time frame from a second set of series connected LEDs, the second wavelength being different from the first wavelength;

a means for providing a shared current source to the first and second set of LEDs from a power supply;

a means for arranging a first switch in series with the first set of LEDs;

a means for arranging a second switch in series with the second set of LEDs; and

a means for coupling a display controller to the power supply and the first and second switches, the display controller adapted to having a means for generating a first and second control signal respectively in accordance with a first and second color frame sequential data, the first control signal operating on at least the power supply or the first switch to drive the first set of LEDs during the first emission time frame, and the second control signal operating on at least the power supply or the second switch to drive the second set of LEDs during the second emission time frame.

20. The circuit of claim 19, further comprising:

a means for generating a third light having a third wavelength during a third emission time frame from a third set of third LEDs, the third wavelength being different from the first and second wavelengths;

a means for coupling a third switch to the third set of LEDs;

a means for providing the shared current source to the third set of LEDs from the power supply; and

wherein the display controller is further adapted to having a means for generating a third control signal in accordance with a third color frame sequential data, the third control signal operating on at least the power supply or the third switch to drive the third set of LEDs during the third emission time frame.

21. A circuit for driving an array of light emitting devices (LEDs) comprising:

a means for generating a first light having a first wavelength from a first set of series connected LEDs;

a means for generating a second light having a second wavelength from a second set of series connected LEDs, the second wavelength being different from the first wavelength;

a means for providing a first and second current source from a power supply to the first and second set of LEDs, respectively;

a means for coupling a display controller to the power supply, the display controller adapted to having a means for generating a first and second control signal respectively in accordance with a color frame data, the first control signal operating on the first current source to drive the first set of LEDs continuously, and the second control signal operating on the second current source to drive the second set of LEDs continuously.

22. The circuit of claim 21, further comprising:

a means for generating a third light having a third wavelength from a third set of series connected third LEDs, the third wavelength being different from the first and second wavelengths;

a means for providing a third current source from the power supply to the third set of LEDs; and

wherein the display controller is further adapted to having a means for generating a third control signal in accordance with the color frame data, the third control signal operating on the third current source to drive the first set of LEDs continuously.

23. A method for driving an array of light emitting devices (LEDs) in a projection display system comprising:

receiving a respective first and second color frame sequential image data for driving an imaging device;

generating a first and second control signal in accordance with the respective first and second color frame sequential image data;

generating a first light having a first wavelength from a first LED color channel during a first emission time frame in response to the first control signal;

generating a second light having a second wavelength from a second LED color channel during a second emission time frame in response to the second control signal; and

propagating the first and second lights to the imaging device.

24. The method of claim 23, further comprising:

receiving a respective third color frame sequential image data for driving the imaging device;

generating a third control signal in accordance with the respective third color frame sequential image data;

generating a third light having a third wavelength from a third LED color channel during a third emission time frame in response to the third control signal; and

propagating the third light to the imaging device.

25. The method of claim 23 wherein the first, second, and third LED color channels emit red, green, and blue light, respectively.

26. The method of claim 23 wherein the first, second, and third LED color channels emit yellow, cyan, and magenta light, respectively.

27. The method of claim 23 wherein the first, second, and third control signals operate on a power supply coupled to the first, second, and third LED color channels to sequentially generate the first, second, and third lights, respectively.

28. The method of claim 23 wherein the first, second, and third control signals operate on a first, second, and third switch coupled to the first, second, and third LED color channels to sequentially generate the first, second, and third lights, respectively.

29. The method of claim 23, wherein the first, second, and third LED color channels comprise at least one of a plurality of series parallel array of light emitting diodes.

30. The method of claim 23 wherein the first, second, and third LED color channels comprise at least one of a plurality of series parallel array laser diodes.

31. The method of claim 27, further comprising generating a compensating control signal to operate on the power supply to compensate for a failed LED in at least one of the first, second, and third LED color channels.

32. The method of claim 28, further comprising generating a compensating control signal to operate on at least one of the first, second, and third switches to compensate for a failed LED in at least one of the first, second, and third LED color channels, respectively.

33. The method of claim 23, wherein the imaging device comprises a DMD, LCOS, or LCD.

34. A method for driving an array of light emitting devices (LEDs) in a projection display system comprising:

receiving a respective first and second color data for driving a respective first and second imaging devices;

generating a first and second control signal in accordance with the respective first and second color data;

generating a first light having a first wavelength from a first LED color channel during a first emission time frame in response to the first control signal;

generating a second light having a second wavelength from a second LED color channel during a second emission time frame in response to the second control signal; and

propagating the first and second lights to the respective first and second imaging devices.

35. The method of claim 34, further comprising:

receiving a third color data for driving a respective third imaging device;

generating a third control signal in accordance with the third color data;

generating a third light having a third wavelength from a third LED color channel during a third emission time frame in response to the third control signal; and

propagating the third light to the respective third imaging device.

36. The method of claim 35 wherein the first, second, and third LED color channels emit red, green, and blue light, respectively.

37. The method of claim 35 wherein the first, second, and third LED color channels emit yellow, cyan, and magenta light, respectively.

38. The method of claim 35 wherein the first, second, and third control signals operate on a first, second, and third current source coupled to the first, second, and third LED color channels to continuously generate the first, second, and third lights, respectively.

39. The method of claim 38 wherein the first, second, and third control signals further operate to adjust a current level of each of the first, second, and third current sources to adjust the brightness of the first, second, and third lights, respectively.

40. The method of claim 35, wherein the first, second, and thirds LED color channels are comprised of at least one of a plurality of series parallel array of light emitting diodes.

41. The method of claim 35, wherein the first, second, and third LED color channels are comprised of at least one of a plurality of series parallel array laser diodes.

42. The method of claim 38, further comprising generating a compensating control signal to operate on at least one of the first, second, and third current sources to compensate for a failed LED in at least one of the first, second, and third LED color channels, respectively.

43. The method of claim 35, wherein the imaging device comprises a DMD, LCOS, or LCD.